

REMARKS

Reconsideration of the present application as amended is respectfully requested. Claims 12-19 and 30-40 are pending. Claim 12 has been amended, claims 30-40 are new.

Claim Objections

The Examiner has objected to claim 19 indicating “modified” should be replaced with “modifier.” Applicant has reviewed claim 19 as originally filed and notes that the term “modifier” was appropriately used. Applicant respectfully requests the Examiner to verify the objection was not made in error.

Claim Rejections - 35 U.S.C. § 102

The Examiner has rejected claims 12, 14, and 17-19 under 35 U.S.C. 102(e) as being anticipated by Jimarez et al. (US Patent 6,757,967) (hereinafter Jimarez). The Examiner has also rejected claims 12, 17, and 19 under 35 U.S.C 102(b) as being anticipated by Marrs et al. (US Patent 5,583,378) (hereinafter Marrs). The Examiner also rejected claims 12, 13, 15, and 19 under 35 U.S.C. 102(e) as being anticipated by Weber et al. (US Patent 6,324,069) (hereinafter Weber).

Claim 12

Independent claim 12, has been amended to clarify that Applicant’s method utilizes a flow modifier to split a mold flow into two or more mold flows to prevent trapped air. It is Applicant’s position that Jimarez fails to anticipate claim 12 because Jimarez does not disclose method where a flow modifier separates an underfill mold flow from an overfill flow. Instead, Jimarez merely discloses a method wherein a material 42 is disposed “in the openings 22 and 30 in the adhesive film 18 and the stiffener member 26” (column 3, lines 5-7, referring to Jimarez Fig 7). Applicant therefore considers neither the adhesive film 18 nor the stiffener member 26 to possibly serve to separate a flow of a first molding compound from a flow of a second molding compound as in Applicant’s claimed method. Indeed, Jimarez states “care must be taken that this conductive material 42 does not extend over and

into contact with the I/C chip . . . which would short out the chip and cause the assembly to be inoperable” (column 3, lines 9-13). Applicant understands this cautionary statement by Jimarez to clearly indicate that film 18 and member 26 fail to substantially separate the flow of material 42 from the flow of material 38, enabling material 42 to short the electrical device connections (Referring to Fig 7). Thus, Applicant’s claimed method of using a flow modifier to substantially separate a flow of said first molding compound from a flow of said second molding compound is not anticipated by Jimarez.

It is Applicant’s position that the Marrs reference fails to disclose a method whereby a “*molding compound*” is applied *over* said second substrate. Applicant understands Marrs to merely disclose a method whereby a lid 460 is attached by an *adhesive* 461. (Marrs, column 16 lines 28-29). Marrs is silent on how the adhesive is applied, but Applicant notes that the common practice in the art is to apply adhesives by means *other than molding* because the adhesion property is incompatible with the clean removal of a mold chase. Therefore, Applicant does not consider the Mars adhesive to be a “*molding compound*,” and so Marrs fail to disclose a method whereby a “*molding compound*” is applied *over* the second substrate, as required by Applicant’s claim 12.

Applicant further notes that the Marrs reference also fails to disclose a method whereby a flow modifier *substantially separates* the flow of material 426 from the flow of material 461, as claimed by Applicant. Applicant notes that Marrs Fig. 4K shows that the material 426 is not at all separated from material 461 by the dam 407. Specifically, referring to Marrs Fig. 4K, the dam 407 merely serves as a structural member supporting lid 460 and prevents the material 426 from reaching the solder balls 418 (Fig 4I). Because Marrs does not disclose the dam 407 to be capable of *substantially separating* a flow of the material 426K from material 461, even if adhesive 461 was applied as a molding compound in a molding process, Marrs fails to anticipate Applicant’s method as claimed in claim 12.

Similarly, it is Applicant’s position that the Weber reference also fails to disclose the method of using a flow modifier to substantially separate a flow of said first molding

compound from a flow of said second molding compound. In contrast, Weber uses standoffs to *facilitate the flow under* the substrate 12 of the molding compound 16 applied *above the substrate* 12 (Weber Fig 7A). Weber specifically states the standoffs “only requirement . . . is a passage for the underfill material to pass around the standoffs during the underfilling process” (Weber, column 6, lines 16-20). Weber also states the standoffs could be “a continuous piece around the chip,” but must have “*apertures to allow the flow* of the underfill material into solder bump area between the circuit chip and the substrate.” (Weber, column 6, lines 23-26). Weber goes on to describe, “the mold compound moves radially inwardly from each of the edges of the integrated circuit chip” (Weber, column 7, lines 50-53). Applicant understands Weber’s statements to describe the flow front of material 16 first covers the substrate, then passes around or through the standoffs, under the chip, and finally out the vent hole 26. Therefore, Applicant understands Weber’s method to have only one mold flow which does not anticipate Applicant’s method using a flow modifier to *substantially separate* a flow of a first molding compound from a flow of a second molding compound.

On this basis, Applicant respectfully requests Examiner to remove the 35 U.S.C. §§102(e) and 102(b) rejections from claim 12. Noting claims 13-19 depend upon claim 12, Applicant understands the cited references also fail to anticipate or render obvious claims 13-19 for at least the same reasons as those provided for claim 12.

New Claims

New claims 30-40 have been added to more particularly claim Applicant’s invention.

Independent Claim 33 describes a method including “*introducing a first molding compound over said second substrate and a second molding compound between said first substrate and said second substrate at substantially the same time.*” Thus, not only are the first and second molding compounds applied in a *single step* (as Examiner considers the Weber reference to disclose), but within the single step, the application is such that the

molding compound is *introduced* to both the top surface and the coupled surface of the second substrate at “*substantially the same time.*” In contrast, Applicant understands the Weber “single step” application to flow *first flow the molding compound over the chip and then under the chip* to the vent hole, as previously highlighted in Applicant’s arguments of claim 12 . So, Weber fails to introduce the molding compound to both regions at “*substantially the same time.*”

Independent Claim 36 describes a method wherein the flow modifier has a height *greater* than the height of the gap between the lower surface of the device and the substrate. The Weber reference cited by the Examiner fails to meet this limitation, because the Weber method uses a standoff, which inherently has the same height as the gap between the lower surface of the device and the substrate. Claim 36 also describes a method of overmolding and underfilling with substantially separated mold flows. Thus, Applicant understands claim 36 to also be allowable in view of the references cited by the Examiner.

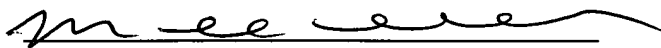
Applicant respectfully submits that in view of the amendments and supporting arguments set forth herein, the present application is in condition for allowance.

Pursuant to 37 C.F.R. 1.136(a)(3), applicant(s) hereby request and authorize the U.S. Patent and Trademark Office to (1) treat any concurrent or future reply that requires a petition for extension of time as incorporating a petition for extension of time for the appropriate length of time and (2) charge all required fees, including extension of time fees and fees under 37 C.F.R. 1.16 and 1.17, to Deposit Account No. 02-2666.

Respectfully submitted,

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